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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,841	01/21/2004	Bernard Roy Katz	J762-001 US	3058
21706	7590	06/10/2005	EXAMINER	
NOTARO AND MICHALOS 100 DUTCH HILL ROAD SUITE 110 ORANGEBURG, NY 10962-2100			KRAMSKAYA, MARINA	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 06/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/761,841

Applicant(s)

KATZ, BERNARD ROY

Examiner

Marina Kramskaya

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Wagner, US 5,486,815.

Wagner discloses a moisture sensing apparatus comprising:

- an oscillator **116** having an output for supplying an AC signal (ABS., line 5);
- a contact sensor (combination of 120, 122, 214) connected to the oscillator for changing the AC signal as a function of moisture content at a surface in contact with the contact sensor (column 1, lines 64-67);
- a precision rectifier (diode **D2**) connected to the sensor for rectifying a signal from the sensor to form a DC signal (a DC signal, column 1, lines 62-64) that is proportional the moisture content (column 1, lines 64-67); and
- a reactive impedance (**154** (R12) & **156** (C7)) connected across the sensor for providing a baseline signal for DC signal.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4, & 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner, US 5,486,815, in view of McCumber et al., US 4,620,141.

As per Claim 1, Wagner discloses a moisture sensing apparatus comprising:

- an oscillator **116** having an output for supplying an AC signal (ABS., line 5);
- a sensor having a sensor pad **120**, a driven ring **214** around the pad and connected to the oscillator **116** output (column 6, lines 33-35), and a ground plate **122** (column 5, lines 13-14) around the ring;
- an operational amplifier (1/4 IC1) having one input **3** connected to the pad, another input **2**, and an output **1**;
- a first diode **D2** connected to the output **1** of the operational amplifier (1/4 IC1) to nullify variations in the rectified signal that are due to temperature induced variations of diode parameters (column 2, lines 1-7), the first diode **D2** having an output for supplying a rectified signal (a DC signal, column 1, lines 62-64) that is a monotonic function of moisture content (column 1, lines 64-67) of material that is in contact with the sensor.

Wagner does not disclose

- a first diode connected in a feedback loop between the operational amplifier output and the other input of the operational amplifier; and
- a second diode connected between the output and the other input of the operational amplifier for reducing output errors.

McCumber discloses

- a first diode **176** connected in a feedback loop between the operational amplifier **134** output and the other input (- input) of the operational amplifier; and
- a second diode **144** connected between the output (of **134**) and the other input (- input) of the operational amplifier **134** for reducing output errors.

Therefore, it would have been obvious to a person of ordinary skill in the art to include the first diode in a feedback connection and a second diode in a feed back connection, as taught by McCumber, in the moisture sensing apparatus of Wagner, in order to provide stability of the signal.

As per Claim 2, Wagner discloses a moisture sensing apparatus, including a reactive impedance (**154** (R12) & **156** (C7)) connected across the pad and ring of the sensor for providing a baseline signal for the rectified signal.

As per Claim 4, Wagner discloses the moisture sensing apparatus further including a differential amplified circuit **190** connected between the operational amplifier (by output **14** to input **3** of the operational amplifier) and the sensor for canceling part of

Art Unit: 2858

a signal from the pad of the sensor (received by input **12**), using a sample of AC signal from the oscillator.

As per Claim 14, Wagner discloses the moisture sensing apparatus as applied to Claim 11, above. Wagner further discloses the precision rectifier comprising:

- an operational amplifier (1/4 IC1) having one input **3** connected to a pad of the sensor, the operational amplifier having another input **2**, and an output **1**,
- a first diode **D2** connected to the output **1** of the operational amplifier to nullify variations in the DC signal that arise from temperature induced variations in diode parameters (column 2, lines 1-7), the first diode **D2** having an output for supplying the DC signal (column 1, lines 62-64).

Wagner does not disclose

- a first diode connected in a feedback loop between the operational amplifier output and the other input of the operational amplifier,
- a second diode connected between the operational amplifier output and the other input of the operational amplifier.

McCumber discloses

- a first diode connected in a feedback loop between the operational amplifier output and the other input of the operational amplifier,
- a second diode connected between the operational amplifier output and the other input of the operational amplifier.

Therefore, it would have been obvious to a person of ordinary skill in the art to include the first diode in a feedback connection and a second diode in a feed back connection, as taught by McCumber, in the moisture sensing apparatus of Wagner, in order to provide stability of the signal.

As per Claim 15, Wagner discloses the moisture sensing apparatus as applied to Claim 14, above. Wagner further discloses the moisture sensing apparatus, including a differential amplified circuit **190** connected between the operational amplifier (by output **14** to input **3** of the operational amplifier) and the sensor for canceling part of a signal from the pad of the sensor (received by input **12**), using a sample of AC signal from the oscillator.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner in view of McCumber as applied to claims 1 & 2 above, and further in view of Stockton, US 5,859,536.

As per Claim 3, Wagner, as modified, discloses the moisture sensing apparatus as applied to Claim 2, above. Wagner further discloses the reactive impedance comprising series connected, resistance and capacitance members.

Wagner does not disclose the reactive impedance that comprises parallel connected, resistance and capacitance members.

Stockton discloses a reactive impedance comprising parallel connected, resistance **R2** and capacitance **C3** members, connected to the sensor pad **12** and driven electrode **10**.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a reactive impedance that comprises parallel connected resistance and capacitance members, as taught by Stockton, in the sensing apparatus of Wagner, in order to provide impedance matching.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner in view of McCumber as applied to claim 1 above, and further in view of Howarth, US 4,845,421.

As per Claim 5, Wagner discloses the moisture sensing apparatus as applied to Claim 1, above. Wagner further discloses the sensor comprising means defining an support substrate (column 3, lines 10-13), the sensor pad **120** being on the support substrate (column 3, lines 10-13), the driven ring being **214** on the support substrate and extending around the pad and spaced from the pad to define a first closed loop around the pad (column 3, lines 5-7), and the ground plate **122** being on the support substrate and extending around the ring and defining a second closed loop around the ring (column 3, lines 7-8), the pad, the ring and the plate all lying in a common contact plane for the sensor (column 3, lines 9-10), which contact plane is adapted to be in contact with a surface for measuring moisture content at the surface as a function of capacitance (column 1, lines 64-67) across the loops, the pad, the ring, the plate.

Wagner discloses in column 4, lines 23-26, that the structure of the sensor of FIG. 2 is that of prior art in FIG. 1.

Wagner does not disclose the loops having no angular corners so as to avoid electrostatic field fringing effects.

Howarth discloses the loops in the sensor having no angular corners so as to avoid electrostatic field fringing effects (see FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a sensor having no angular corners, as taught by Howarth, in the sensor of Wagner, in order to eliminate electrostatic fringing in the corners, (see fringing in rectangular embodiment in FIG. 6 and no fringing in the circular embodiment of FIG. 7).

7. Claims 6-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner in view of Howarth.

As per Claim 6, Wagner discloses a contact sensor for a moisture sensing apparatus having an oscillator **116** with an output for supplying an AC signal (ABS., line 5) and an operational amplifier (1/4 IC1, with inputs **2** & **3** and output **1**) with rectifier means (diode **D2**) for supplying a rectified signal that is proportional to a moisture content of material that is in contact with a contact plane of the contact sensor (a DC signal, column 1, lines 62-67), the contact sensor comprising:

- means defining an support substrate (column 3, lines 10-13);
- a conductive sensor pad **120** on the support substrate (column 3, lines 10-13);

Art Unit: 2858

- a conductive driven ring **214** on the support substrate, extending around the pad and spaced from the pad to define a first closed loop around the pad (column 3, lines 5-7); and
- a conductive ground plate **122** on the support substrate, extending around the ring and defining a second closed loop around the ring (column 3, lines 7-8);
- the pad, the ring and the plate all lying in the contact plane for the sensor (column 3, lines 9-10), which contact plane is adapted to be in contact with a surface for measuring moisture content at the surface, as a function of capacitance across the loops (column 1, lines 64-67).

Wagner does not disclose a moisture sensing apparatus with the pad, the ring, the plate, and the loops having no angular corners to avoid electrostatic field fringing effects.

Howarth discloses a moisture sensing apparatus having a pad, a ring, a plate, and loops having no angular corners to avoid electrostatic field fringing effects (see FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a sensor having no angular corners, as taught by Howarth, in the sensor of Wagner, in order to eliminate electrostatic fringing in the corners, (see fringing in rectangular embodiment in FIG. 6 and no fringing in the circular embodiment of FIG. 7).

As per Claims 7-9, the applicant discloses that sensors of geometrical shape other than those with angular corners are suitable for an optimum sensor. Wagner in view of Howarth disclose the moisture sensing apparatus as applied to Claim 6, above.

Wagner does not teach of a sensor with no angular corners.

Howarth teaches of a circular sensor (FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a circular, oval, race-track, or a rectangular with rounded corners shaped sensor, in order to eliminate electrostatic fringing. See MPEP 2144.04, *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

As per Claim 10, Wagner in view of Howarth disclose the moisture sensing apparatus as applied to Claim 6, above.

Wagner in view of Howarth do not explicitly teach the size (or radii) of the sensor component.

However, Howarth does teach a circular shaped sensor with a circular pad, ring, plate, and circular loops. It would have been obvious to a person of ordinary skill in the art to select a radius of an appropriate size through routine experimentation. See MPEP 2144.04, *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984).

As per Claim 13, Wagner discloses the moisture sensing apparatus as applied to Claim 11, above.

Wagner does not disclose the sensor having a central pad with no angular corners.

Howarth discloses moisture sensing apparatus with the sensor having a central pad **31** with no angular corners (see FIG. 7B).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a sensor having no angular corners, as taught by Howarth, in the sensor of Wagner, in order to eliminate electrostatic fringing in the corners, (see fringing in rectangular embodiment in FIG. 6 and no fringing in the circular embodiment of FIG. 7).

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner in view of Stockton.

Wagner discloses the moisture sensing apparatus as applied to Claim 12, above. Wagner further discloses the reactive impedance comprising series connected, resistance and capacitance members (**154** (R12) & **156** (C7)).

Stockton discloses 12. The moisture sensing apparatus having a reactive impedance comprising parallel connected resistance **R2** and capacitance **C3** members, connected to the sensor pad **12** and driven electrode **10**.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a reactive impedance that comprises parallel connected resistance and capacitance members, as taught by Stockton, in the sensing apparatus of Wagner, in order to provide impedance matching.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Honma et al., US 4,966,158, discloses a capacitive moisture sensing apparatus with a circular shaped sensor and a diode AC to DC rectifier. Ahtiainen, US 4,259,632, and Rauchwerger, US 3,771,548, disclose a capacitive moisture sensing apparatus including an oscillator and amplifiers with diode feedback loops for rectification of the AC signal. Cambell, US 5,479,104, discloses a capacitive moisture sensor with a oscillator and a parallel RC impedance and diode rectifiers.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2858

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MK


ANJAN DEB
PRIMARY EXAMINER

Marina Kramskaya
Examiner
Art Unit 2858

